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ABSTRACT

One of twelve individualized courses included in automotive repair curriculum, this course focuses on the identification and proper use of basic hand tools, precision tools, and general shop equipment. The course is comprised of three units: (1) Basic Tools, (2) Special Tools, and (3) Shop Equipment. Each unit begins with a Unit Learning Experience Guide that gives directions for unit completion. The remainder of the unit consists of Learning Activity Packages (LAP) that provide specific information for completion learning activity. Each LAP is comprised of the following parts: objective, evaluation procedure, resources, procedure, supplemental sheets, study guide, and a LAP test with answers. The course is preceded by a pretest which is designed to direct the student to units and performance activities. (LRA)

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ED197141

MOUNTAIN PLAINS LEARNING EXPERIENCE GUIDE:

Automotive Repair.

Course: Tools and Equipment.

CE 027 769

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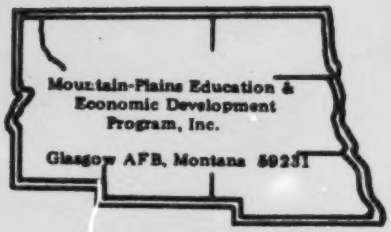

Learning Experience Guide

COURSE: TOOLS AND EQUIPMENT

DESCRIPTION:

Tools and Equipment includes the identification and proper use of basic hand tools, precision tools, and general shop equipment.

RATIONALE:

Tools are important to the mechanic. Recognition of the right tools for the job and proper care and use of tools enables the mechanic to perform his work quickly and efficiently.

PREREQUISITES:

None

OBJECTIVE:

Recognize proper care and use of the tools and equipment used for automotive diagnosis, repair and servicing.

RESOURCES:

A resource list is attached.

GENERAL INSTRUCTIONS:

This course has three units. Each unit has a Unit Learning Experience Guide (LEG) that gives directions for unit completion. Each unit consist of Learning Activity Packages (LAPs) that provide specific information for completion of a learning activity. Pretesting results direct the student to units and performance activities.

The general procedure for this course is as follows:

(1) Read the assigned unit LEG for this course.
(2) Begin and complete the first assigned LAP.
    a. Take and score the LAP test.
    b. Turn in the LAP test answer sheet.
    c. Determine the reason for any missed items on the LAP test.
    d. Proceed to the next assigned LAP in the unit.
    e. Complete all required LAPs for the unit by following steps (a) through (d).

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GENERAL INSTRUCTIONS: (cont.)

(3) Take the unit tests as described in the Unit LEG "Evaluation Procedures".
(4) Proceed to the next assigned unit in this course.
(5) Follow steps 1 through 4 for all required units for this course.
(6) Proceed to the next assigned course.

You will work independently unless directed to do otherwise. When questions or problems arise, you are expected to discuss them with the instructor. At all times remember to follow correct safety procedures during the performance activity.

UNIT TITLES:

.01 Basic Tools
.02 Special Tools
.03 Shop Equipment

EVALUATION PROCEDURE:

Course evaluation is by pre and post testing using a multiple-choice type of test.

In this course, the course test is used as a pretest to determine which units, if any, the student may be able to validate. The student is considered validated for a particular unit if 4 out of 5 items are correctly answered for each LAP part on the course pretest and that particular unit does not have a performance test requirement.

For those units with performance test requirements, the student must also satisfactorily complete the performance test to validate that unit. Unit performance test validation procedures are given in the "Evaluation Procedure" section of the unit Learning Experience Guide (LEG).

The course test will also be taken by the student as a post test to determine any changes resulting from taking all or part of the course. Score at least 80% on the course post test.

FOLLOW-THROUGH:

Go to the first unit Learning Experience Guide (LEG) listed on your Student Progress Record (SPR).

RESOURCE LIST

Printed Materials

1. Auto Mechanics Fundamentals. Martin W. Stockel, Goodheart-Willcox Company, Inc.
2. Auto Service and Repair. Martin W. Stockel, Goodheart-Willcox Company, Inc.

Audio/Visuals

none

Equipment

1. Cylinder taper gauge.
2. Dial indicator.
3. Jacks.
4. Lifts.
5. Micrometers: inside
   outside
   depth
6. Presses: arbor
   piston pin
7. Pullers: axle
   flywheel
   pully
   seal
   steering wheel
   vibrator dampener
8. Rules.
9. Scales.
10. Telescoping gauge.
11. Tools, basic hand: chisel and punch set
    5/32" pin punch
    3/16" solid
    gauge, feeler (.002" - .025")
    hammer, ball peen
    hammer, plastic tip
    handle, speed
    hex key set
    pliers, diagonal cutting
    pliers, needle nose
    scraper, gasket
    screwdriver, standard (set)
    screwdriver, Phillips (set)
    screw starter

socket set (3/8" drive)
extension (3")
ratchet
socket set (1/4" drive)
extension (3")
handle (6" flex)
ratchet
socket, spark plug
extension (6")
wrench, combination (set)
wrench, combination ignition (set)

12. Wrench, torque

7/15/75

Student: _____ File Code: 37.02.00.00.B1-2

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COURSE PRE/POST TEST: TOOLS AND EQUIPMENT

37.02.01.01

1. A tap that is not commonly used in most general shops is the:

   a. bottoming.
   b. taper.
   c. starting.
   d. plug.

2. Socket drive sizes available for the mechanic to use are:

   a. 1/16, 1/4, 3/8, 1/2.
   b. 1", 3/4, 1/2, 1/4.
   c. 1/4, 3/8, 1/2, 3/4.
   d. metric, 1/4, 3/8, 3/4, 1/2.

3. A ball peen hammer is not used for:

   a. general striking.
   b. hubcap installation.
   c. riveting.
   d. gasket cutting.

4. The hand wrench recommended for fuel line or brake line work is the:

   a. double-offset wrench.
   b. flare-nut wrench.
   c. open-end wrench.
   d. box-end wrench.

5. To protect finish work being held in a vice, which of the following are available as an attachment?

   a. steel jaws.
   b. copper jaws.
   c. sharp jaws.
   d. dull jaws.

37.02.01.02

6. Open-end wrenches have the head offset at an angle of approximately:

   a. 45 degrees.
   b. 30 degrees.
   c. 35 degrees.
   d. 15 degrees.

37.02.01.02 (continued)

7. The major loss of hand tools by the mechanic is caused by the habit of:

   a. placing the tools on the engine and engine compartment while working.
   b. carrying tools to various areas while working on specific unit.
   c. keeping the tools clean and orderly.
   d. keeping his tool box locked at all times.

8. Most common damage to a diagonal pliers is:

   a. cutting materials too thick.
   b. cutting tempered-strength materials.
   c. storing loosely in the bottom of the tool box.
   d. applying too much pressure while cutting.

9. The little time it takes to keep your tools clean and orderly will prevent:

   a. none of the below
   b. unnecessary damage to tools.
   c. excessive time loss on the job.
   d. excessive loss of tools.

10. Most common damage occurence of sockets is the misuse of a socket as an:

   a. emergency bushing driver.
   b. incorrect opening.
   c. incorrect drive.
   d. applying too much pressure.

37.02.02.01

11. The work piece to be measured is placed between what parts of the outside micrometer?

   a. anvil and spindle.
   b. anvil and sleeve.
   c. frame and anvil.
   d. frame and spindle.

12. One thousandths of an inch is written as:

   a. 100 ths. inch.
   b. .01 inch.
   c. .0001 inch.
   d. .001 inch.

13. To clean a precision measuring tool, the mechanic:

   a. can wipe the tool with a soft dry rag.
   b. can wipe the tool with a rag soaked with solvent.
   c. can carefully dip the tool in solvent and blow dry.
   d. none of the above.

37.02.02.01 (continued)

14. Telescoping gauges can be used to accurately measure:

a. length of small bores.
b. piston travel in a cylinder.
c. none of the answers.
d. inside bore diameters.

15. Used spark plugs must have their gap checked with a:

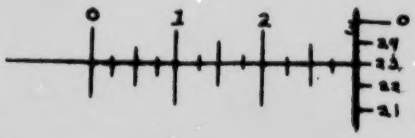
a. thickness gauge.
b. feeler gauge.
c. steel rule.
d. wire gauge.

37.02.02.02

16. Dial indicator face markings are most commonly marked in:

a. thousandths of an inch.
b. ten-thousandths of an inch.
c. thousandths in fractions.
d. none of the above.

17. The illustration below shows which of the following micrometer readings?

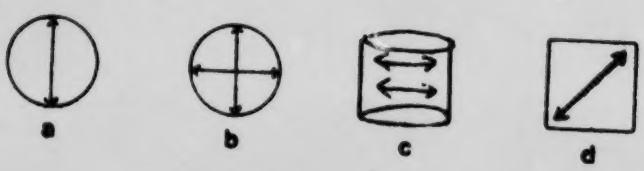


a. .328
b. .298
c. .268
d. .323

18. An accurate measurement of minimal movement would be done most effectively with a(n):

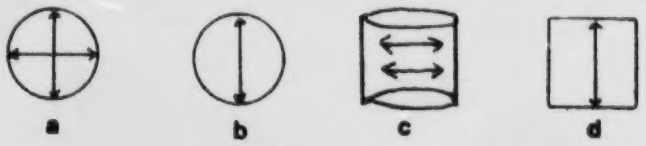
a. inside micrometer.
b. telescoping gauge.
c. feeler gauge.
d. dial indicator.

19. Which of the following shows the correct way to take an inside taper measurement of a cylinder?



37.02.02.02 (continued)

20. Which of the following illustrations shows the correct way to take an out of round measurement of a cylinder?



37.02.02.03

21. The pulling force on a fastener is referred to as:

a. distortion.
b. tension.
c. elastic limit.
d. torque.

22. The operating clearance between the nut internal threads and the bolt external threads is called the:

a. thread size.
b. thread class.
c. thread pitch.
d. none of the above.

23. The torque wrench uses what law in its construction?

a. Law of Relativity.
b. Law of Distortion
c. Hooke's Law.
d. Ohm's Law.

24. It has been found that for the vast majority of application, a fastener should be tightened until it has built up a tension within itself that is around 50 to 60 percent of its:

a. tension.
b. none of the answers.
c. torque.
d. elastic limit.

25. Radial lines on bolt heads indicate:

a. tensile strength.
b. residual tension.
c. distortion.
d. elastic limit.

37.02.03.01

26. Work beneath a vehicle (after raised with a jack) should be done only after:

a. locking the parking brake.
b. the installation of jackstands.
c. the installation of jack locking mechanisms.
d. the installation of frame lifts.

27. The portion of a jackstand or jack that contacts the lifting point is called:

a. lift-contact.
b. saddle.
c. cup.
d. lift-center.

28. A unit that presents a relatively large obstruction area on a raised vehicle is the:

a. double-post suspension lift.
b. double-post frame lift.
c. drive-on lift.
d. single-post frame lift.

29. A piece of shop equipment that can be used to move vehicles around in tight places is the:

a. hydraulic hand jack.
b. hydraulic floor jack.
c. extension jack.
d. wheel dolly.

30. When operating a bumpter jack, the bumper contacts should be placed:

a. near the center of the bumper.
b. at each end of the bumper.
c. on the thickest part of the bumper.
d. at the frame to bumper brackets.

37.02.03.02

31. A single or double-post frame lift requires that the lift pads be:

a. none of the below.
b. adjusted to life the body evenly.
c. adjusted to lift the center of the vehicle.
d. adjusted to match the frame.

32. The pressure release mechanism on a floor jack is located on the:

a. handle end.
b. handle grips (side).
c. jack body.
d. foot pump.

37.02.03.03

33. The large puller set available from the toolroom which has several available arm sets is referred to as:

    a. a 3-finger slide hammer.
    b. a hub puller.
    c. a wheel puller.
    d. a mechanical puller.

34. The abbreviation P.S.I. while working with a press stands for the words:

    a. pressure steadily increased.
    b. pressure solidly increased.
    c. pounds per square inch.
    d. perfected squared increasment.

37.02.03.04

35. Failure to keep the toolroom in proper order would cause a major problem which is:

    a. all of the below.
    b. loss of parts tools and equipment.
    c. loss of mechanic's time.
    d. possible damage to valuable equipment.

UNIT TEST ANSWER SHEET

Occupational Ares: Automotive
File Code: 37.02
Name: _____
Family Pay Number: _____ Sex: M F (Circle 1)

ANSWERS

0101	1.	C	0203	21.	B	41.	
	2.	C		22.	B	42.	
	3.	B		23.	C	43.	
	4.	B		24.	D	44.	
	5.	B		25.	A	45.	
0102	6.	D	0301	26.	B	46.	
	7.	A		27.	B	47.	
	8.	B		28.	C	48.	
	9.	C		29.	B	49.	
	10.	A		30.	D	50.	
0201	11.	A	0302	31.	D	51.	
	12.	D		32.	A	52.	
	13.	A	0303	33.	C	53.	
	14.	D		34.	C	54.	
	15.	D	0304	35.	A	55.	
0202	16.	A		36.		56.	
	17.	B		37.		57.	
	18.	D		38.		58.	
	19.	C		39.		59.	
	20.	A		40.		60.	

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Glasgow AFB, Montana 59431

Learning Experience Guide

UNIT: BASIC TOOLS

RATIONALE:

The identification and use of basic tools in this unit will enable one to properly operate the basic tools used by the automotive mechanic.

PREQUISITES:

None

OBJECTIVES:

Recognize the basic hand tools and their proper care and use.

RESOURCES:

Printed Material

Auto Service and Repair. Stockel, Goodheart-Willcox Company, Inc., 1969

Equipment

Basic Hand Tools:

- Chisel and punch set
  - 5/32" pin punch
  - 3/16" solid
- Gauge, feeler (.002" - .025")
- Hammer, ball peen
- Hammer, plastic tip
- Handle, speed
- Hex key set
- Pliers, diagonal cutting
- Pliers, needle nose
- Scraper, gasket
- Screwdriver, standard (set)
- Screwdriver, Phillips (set)
- Screw starter
- Socket set (3/8" drive)
  - extension (3")
  - ratchet

Principal Author(s):

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RESOURCES: Equipment (cont.)

Socket set (1/4 drive)
extension (3")
handle (6" flex)
ratchet
Socket, spark plug
extension (6")
Wrench, combination (set)
Wrench, combination ignition (set)

GENERAL INSTRUCTIONS:

This unit consists of two Learning Activity Packages (LAPs). Each LAP will provide specific information for completion of a learning activity.

The general procedure for this unit is as follows:

(1) Read the first assigned Learning Activity Package (LAP).
(2) Begin and complete the first assigned LAP.
(3) Take and score the LAP test.
(4) Turn in the LAP test answer sheet.
(5) Determine the reason for any missed items on the LAP test.
(6) Proceed to and complete the next assigned LAP in the unit.
(7) Complete all required LAPs for the unit by following steps 3 through 6.
(8) Take the unit tests as described in the Unit LEG "Evaluation Procedures".
(9) Proceed to the next assigned unit.

PERFORMANCE ACTIVITIES:

.01 Hand Tool Fundamentals
.02 Hand Tool Practice

EVALUATION PROCEDURE:

Score at least 80% correct answers on the post test. There is no performance test with this unit.

FOLLOW-THROUGH:

Go to the first Learning Activity Package (LAP) listed on your Student Progress Record (SPR).

Student: _____ File Code: 37.02.01.00.B1-2

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UNIT PRETEST: BASIC TOOLS

37.02.01.01

1. Course cut files are recommended for:

   a. lead.
   b. aluminum.
   c. brass.
   d. all of the above.

2. Carbon twist drill bits are:

   a. the most expensive and longer lasting drill bits.
   b. the most inexpensive and longer lasting drill bits.
   c. none of the above.
   d. the most inexpensive and need more sharpening.

3. To loosen a difficult bolt, it is recommended to use a:

   a. socket ratchet handle.
   b. socket speed handle.
   c. socket spinner handle.
   d. socket flex handle.

4. Box-end wrenches are available in what openings?

   a. 3 and 6
   b. 8 and 14
   c. 6 and 12
   d. 3 and 6 and 12

5. In drilling a hole to thread for a chosen bolt, the mechanic should choose a:

   a. drill bit the same size as the bolt diameter.
   b. drill bit smaller than the needed tap size.
   c. tap and a drill bit the same diameter as the chosen bolt.
   d. a drill bit the same size as the needed tap.

37.02.01.02

6. In sharpening a carbon steel drill, to prevent loss of drill metal strength, it is recommended to:

   a. use a five grit grinder stone and water.
   b. grind slowly and frequently quench the drill.
   c. use a drill gauge and cooling oil while sharpening.
   d. apply pressure on the bit while grinding in short intervals.

7. Hacksaw blades for general shop use come in what number of teeth?

   a. fine, medium, course
   b. 10, 15, 20 per inch
   c. 18, 24, 32 per inch
   d. light, medium, heavy

8.

9. The one most common abuse of hand tools found in the shop is:

   a. failure to keep tools orderly.
   b. using screwdrivers to pry or hammer.
   c. failure to keep hand tools clean.
   d. using the incorrect strength tool for difficult fixtures.

10. An open-end hand wrench that has its opening "warped" open is due to:

   a. using the wrench to "break" loose a tight bolt.
   b. using an over-sized wrench on a tight bolt.
   c. forcing an undersized wrench onto a difficult bolt.
   d. striking the other end of the wrench with a hammer to dislodge a difficult bolt.

UNIT PRETEST ANSWER KEY: BASIC TOOLS

LAP 01

1. d
2. d
3. d
4. c
5. b

LAP 02

6. b
7. c
8. b
9. c
10. a

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Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Hand Tool Fundamentals

OBJECTIVE:

Identify appropriate uses for certain basic hand tools used in the automotive shop.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Service and Repair, Stockel.

Basic Hand Tools

PROCEDURE:

1. Read Chapter 1, pages 1-7 to 1-24, in Auto Service and Repair.
2. Study Figures 1-1 to 1-55 in Auto Service and Repair.
3. On a separate sheet of paper, write the answers to the following questions on page 1-24 in Auto Service and Repair:

   1, 2, 4, 9, 12, 19, 20, 23, 25, 28, 30 and 36

4. Return the textbook and give the answer sheet to the instructor.
5. Obtain a copy of the LAP test.
6. Complete and score the LAP test. Return the answer sheet.
7. If the score is less than 80%, review the material.
8. Upon successful completion, go to the next LAP.

Principal Author(s):

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Author: _____ File Code: 37.02.01.01.B1-2

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LAP TEST: HAND TOOL FUNDAMENTALS

1. Coarse cut files are recommended for:

   a. lead
   b. aluminum
   c. brass
   d. all of the above

2. Pin punches are used for:

   a. cutting.
   b. shaping.
   c. driving
   d. locking.

3. What should be used to mark work before drilling?

   a. diamond chisel.
   b. alignment punch.
   c. center punch.
   d. starting punch.

4. To protect finish work being held in a vise, which of the following are available as an attachment:

   a. sharp jaws
   b. dull jaws
   c. steel jaws
   d. copper jaws

5. Carbon twist drill bits are:

   a. the most expensive and longer lasting drill bits.
   b. the most inexpensive and longer lasting drill bits.
   c. none of the above.
   d. fairly inexpensive and need more sharpening.

6. The hand wrench recommended for fuel line or brake line work is the:

   a. box-end wrench.
   b. open-end wrench.
   c. flare-nut wrench.
   d. double-offset wrench.

7. Socket drive sizes available for the mechanic to use are:

   a. 1/16, 1/4, 3/8, 1/2.
   b. 1/4, 3/8, 1/2, 3/4 inch.
   c. 1", 3/4, 1/2, 1/4.
   d. metric, 1/4, 3/8, 3/4, 1/2.

8. Box-end wrenches are available with how many points in the opening?

   a. 4 and 16
   b. 8 and 14
   c. 6 and 12
   d. 3 and 6 and 12

9. In drilling a hole to thread for a chosen bolt, the mechanic should choose a:

   a. drill bit the same size as the bolt diameter.
   b. drill bit smaller than the needed tap size.
   c. tap and a drill bit the same diameter as the chosen bolt.
   d. drill bit the same size as the needed tap.

10. A tap that is not commonly used in most general shops is the:

   a. taper
   b. starting
   c. bottoming
   d. plug

LAP TEST ANSWER KEY: HAND TOOL FUNDAMENTALS

1. D
2. C
3. C
4. D
5. D
6. C
7. B
8. C
9. B
10. B

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Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Hand Tool Practice

OBJECTIVE:

Identify and practice proper care and use of hand tools used in the automotive shop.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Service and Repair, Stockel.

Basic Hand Tools

PROCEDURE:

1. Review Chapter 1 in Auto Service and Repair.
2. Study carefully the sections on proper care and use of hand tools in Auto Service and Repair.
3. Go out into the shop and politely evaluate the other students' tool boxes. Record the number of properly cared for tool boxes over the number of all the tools boxes that you inspected.
4. Record the one major abuse of hand tools found during the inspection.
5. Obtain a copy of the LAP test from the instructor.
6. Complete and score the LAP test. Return the answer sheet.
7. If the score is less than 80%, review the material.
8. Upon successful completion, go to the next LAP.

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C. Schramm/W. Osland

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LAP TEST: HAND TOOL PRACTICE

1. The little time it takes to keep your tools clean and orderly will prevent:

   a. excessive loss of tools.
   b. excessive time loss on the job.
   c. unnecessary damage to tools.
   d. none of the above.

2. In sharpening a carbon steel drill, to prevent loss of drill metal strength, it is recommended to:

   a. use a five grit grinder stone and water.
   b. grind slowly and frequently quench the drill.
   c. use a drill gauge and cooling oil while sharpening.
   d. apply pressure on the bit while grinding in short intervals.

3. Hacksaw blades for general shop use come in what sizes of teeth?

   a. fine, medium, course
   b. 10, 15, 20 per inch
   c. 18, 24, 32 per inch
   d. light, medium, heavy

4. The most common abuse of hand tools found in the shop is:

   a. failure to keep the tools orderly.
   b. using screwdrivers to pry or hammer.
   c. failure to keep hand tools clean.
   d. using the incorrect strength tool for difficult fixtures.

5. Open-end wrenches have the head offset at an angle of approximately:

   a. 35 degrees.
   b. 15 degrees.
   c. 30 degrees.
   d. 45 degrees.

6. It is best practice before oiling a machine to:

   a. turn it on.
   b. turn it off.
   c. make sure it is warmed up.
   d. make sure the power plug is removed.

7. Normally the hacksaw blade teeth should point:

   a. toward the right hand.
   b. toward the handle.
   c. away from the handle.
   d. none of the above.

8. Most common damage occurrence of sockets is the misuse of a socket as an:

   a. incorrect drive.
   b. emergency bushing driver.
   c. incorrect opening.
   d. applying too much pressure.

9. Three types of wrenches are:

   a. square, cape, and socket.
   b. open-end, box, and socket.
   c. open-end, socket, and center.
   d. open-end, metric, and socket.

10. The major loss of hand tools by the mechanic is caused by the habit of:

   a. placing the tools on the engine and engine compartment while working.
   b. carrying tools to various areas while working on specific unit.
   c. keeping the tools clean and orderly.
   d. keeping his box locked at all times.

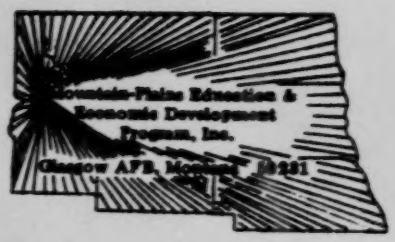
LAP TEST ANSWER KEY: HAND TOOL PRACTICE

1. B
2. B
3. C
4. B
5. B
6. D
7. C
8. B
9. B
10. A

Student: _____ File Code: 37.02.01.00 C1-2 (A)

Date: _____ Date Published: 3-16-76

Retyped: 9-12-79



UNIT POST TEST: BASIC TOOLS

37.02.01.01

1. A ball peen hammer is not used for:

   a. riveting.
   b. gasket cutting.
   c. hubcap installation.
   d. general striking.

2. Coarse cut files are recommended for:

   a. lead.
   b. aluminum.
   c. brass.
   d. all of the above.

3. A tap that is not commonly used in most general shops is the:

   a. taper.
   b. starting.
   c. bottoming.
   d. plub.

4. To loosen a difficult bolt, it is recommended to use a:

   a. socket ratchet handle.
   b. socket speed handle.
   c. socket spinner handle.
   d. socket flex handle.

5. To protect finish work being held in a vice, which of the following are available as an attachment?

   a. copper jaws.
   b. sharp jaws.
   c. dull jaws.
   d. steel jaws.

37.02.01.02

6. In sharpening a carbon steel drill, to prevent loss of drill metal strength, it is recommended to:

   a. use a five grit grinder stone and water.
   b. grind slowly and frequently quench the drill.
   c. use a drill gauge and cooling oil while sharpening.
   d. apply pressure on the bit while grinding in short intervals.

37.02.01.02 (continued)

7. Open-end wrenches have the head offset at an angle of approximately:

   a. 35 degrees.
   b. 30 degrees.
   c. 15 degrees.
   d. 45 degrees.

8. The one most common abuse of hand tools found in the shop is:

   a. failure to keep the tools orderly.
   b. using screwdrivers to pry or hammer.
   c. failure to keep hand tools clean.
   d. using the incorrect strength tool for difficult fixtures.

9. An open-end hand wrench that has its openings "warped" open is due to:

   a. using the wrench to "break" loose a tight bolt.
   b. using an over-sized wrench on a tight bolt.
   c. forcing an undersized wrench onto a difficult bolt.
   d. striking the other end of the wrench with a hammer to dislodge a difficult bolt.

10. The major loss of hand tools by the mechanic is caused by the habit of:

   a. placing the tools on the engine and engine compartment while working.
   b. carrying tools to various areas while working on specific unit.
   c. lending tools to fellow mechanics and friends.
   d. failing to keep his tool box locked while gone.

UNIT POST TEST ANSWER KEY: BASIC TOOLS

LAP 01

1. C
2. D
3. B
4. D
5. A

LAP 02

6. B
7. C
8. B
9. A
10. A

Student: _____ File Code: 37.02.01.00.C1-2(B)

Date: _____ Date Published: 5-24-77

UNIT POST TEST: BASIC TOOLS (B)

37.02.01.01

1. To protect finish work being held in a vice, which of the following are available as an attachment?

   a. copper jaws
   b. sharp jaws
   c. dull jaws
   d. steel jaws

2. To loosen a difficult bolt, it is recommended to use a:

   a. socket ratchet handle.
   b. socket speed handle.
   c. socket spinner handle.
   d. socket flex handle.

3. A tap that is not commonly used in most general shops is the:

   a. taper.
   b. starting.
   c. bottoming.
   d. plug.

4. Course cut files are recommended for:

   a. lead.
   b. aluminum.
   c. brass.
   d. all of the above.

5. A ball peen hammer is not used for:

   a. riveting.
   b. gasket cutting.
   c. hubcap installation.
   d. general striking.

37.02.01.02

6. The major loss of hand tools by the mechanic is caused by the habit of:

   a. placing the tools on the engine and engine compartment while working.
   b. carrying tools to various areas while working on specific unit.
   c. lending tools to fellow mechanics and friends.
   d. failing to keep his tool box locked while gone.

37.02.01.02

7. An open-end hand wrench that has its openings "warped" open is due to:

   a. using the wrench to "break" loose a tight bolt.
   b. using an over-sized wrench on a tight bolt.
   c. forcing an undersized wrench onto a difficult bolt.
   d. striking the other end of the wrench with a hammer to dislodge a difficult bolt.

8. The one most common abuse of hand tools found in the shop is:

   a. failure to keep the tools orderly.
   b. using screwdrivers to pry or hammer.
   c. failure to keep hand tools clean.
   d. using the incorrect strength tool for difficult fixtures.

9. Open-end wrenches have the head offset at an angle of approximately.

   a. 35 degrees
   b. 30 degrees
   c. 15 degrees
   d. 45 degrees

10. In sharpening a carbon steel drill, to prevent loss of drill metal strength, it is recommended to:

   a. use a five grit grinder stone and water.
   b. grind slowly and frequently quench the drill.
   c. use a drill gauge and cooling oil while sharpening.
   d. apply pressure on the bit while grinding in short intervals.

UNIT POST TEST ANSWER KEY: BASIC TOOLS (B)

LAP 01

1. A
2. D
3. B
4. D
5. C

LAP 02

6. A
7. A
8. B
9. C
10. B

Student: _____ File Code: 37.02.01.00.C1-2(C)

Date: _____ Date Published: 5-24-77

UNIT POST TEST: BASIC TOOLS (C)

37.02.01.01

1. To protect finish work being held in a vice, which of the following are available as an attachment?

   a. copper jaws
   b. sharp jaws
   c. dull jaws
   d. steel jaws

2. A ball peen hammer is not used for:

   a. riveting.
   b. gasket cutting.
   c. hubcap installation.
   d. general striking.

3. Course cut files are recommended for:

   a. lead.
   b. aluminum
   c. brass.
   d. all of the above.

4. To loosen a difficult bolt, it is recommended to use a:

   a. socket ratchet handle.
   b. socket speed handle.
   c. socket spinner handle.
   d. socket flex handle.

5. A tap that is not commonly used in most general shops is the:

   a. taper.
   b. starting.
   c. bottoming.
   d. plug.

37.02.01.02

6. Open-end wrenches have the head offset at an angle of approximately:

   a. 35 degrees.
   b. 30 degrees.
   c. 15 degrees.
   d. 45 degrees.

37.02.01.02 (continued)

7. An open-end hand wrench that has its openings "warped" open is due to:

   a. using the wrench to "break" loose a tight bolt.
   b. using an over-sized wrench on a tight bolt.
   c. forcing an undersized wrench onto a difficult bolt.
   d. striking the other end of the wrench with a hammer to dislodge a difficult bolt.

8. The one most common abuse of hand tools found in the shop is:

   a. failure to keep the tools orderly.
   b. using screwdrivers to pry or hammer.
   c. failure to keep hand tools clean.
   d. using the incorrect strength tool for difficult fixtures.

9. The major loss of hand tools by the mechanic is caused by the habit of:

   a. placing the tools on the engine and engine compartment while working.
   b. carrying tools to various areas while working on specific nut.
   c. lending tools to fellow mechanics and friends.
   d. failing to keep his tool box locked while gone.

10. In sharpening a carbon steel drill, to prevent loss of drill metal strength, it is recommended to:

    a. use a five grit grinder stone and water.
    b. grind slowly and frequently quench the drill.
    c. use a drill gauge and cooling oil while sharpening.
    d. apply pressure on the bit while grinding in short intervals.

UNIT POST TEST ANSWER KEY: BASIC TOOLS (C)

LAP 01

1. A
2. C
3. D
4. D
5. B

LAP 02

6. C
7. A
8. B
9. A
10. B

File Code: 37.02.02.00. B1-1

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.

Glasgow AFB, Montana 59231

Learning Experience Guide

UNIT: SPECIAL TOOLS

RATIONALE:

The identification and use of precision tools, fasteners, and torque wrench in this unit will enable one to properly operate the special tools used by the automotive mechanic.

PREREQUISITES:

None

OBJECTIVES:

Recognize the special tools used in automotive. Demonstrate the proper use of special tools.

RESOURCES:

Printed Material

Auto Service and Repair. Stockel, Goodheart-Willcox Company, Inc.

Equipment

Cylinder taper gauge
Dial indicator
Micrometer
  inside
  outside
  depth
Rules
Scales
Telescoping gauge
Wrench, torque

Principal Author(s):

C. Schramm/W. Osland

GENERAL INSTRUCTIONS:

This unit consits of three Learning Activity Packages (LAPs). Each LAP will provide specific information for completion of a learning activity.

The general procedure for this unit is as follows:

(1) Read the first assigned Learning Activity Package (LAP).
(2) Begin and complete the first assigned LAP.
(3) Take and score the LAP test.
(4) Turn in the LAP test answer sheet.
(5) Determine the reason for any missed items on the LAP test.
(6) Proceed to and complete the next assigned LAP in the unit.
(7) Complete all required LAPs for the unit by following steps 3 through 6.
(8) Take the unit tests as described in the Unit LEG "Evaluation Procedures".
(9) Proceed to the next assigned unit.

PERFORMANCE ACTIVITIES:

.01 Precision Measuring Tools Fundamentals
.02 Precision Measuring Tools Practice
.03 Fasteners and Torque Wrench

EVALUATION PROCEDURE:

When pretesting:

1. Take the unit multiple-choice pretest.
2. Successful completion is 4 out of 5 items for each LAP part of the pretest.
3. Take a unit performance test if the unit pretest was successfully completed.
4. Satisfactory completion of the performance test is meeting the criteria listed on the performance test.

When post testing:

1. Take a multiple-choice unit post test and a unit performance test.
2. Successful unit completion is meeting the listed criteria for the performance test.

Score at least 80% correct answers on the unit post test and score 80% correct answers on the unit performance test.

FOLLOW-THROUGH:

Go to the first Learning Activity Package (LAP) listed on your Student Progress Record (SPR).

Student: _____ File Code: 37.02.02.00.B1-2

Date: _____ Date Published: 3/16/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

UNIT PRETEST: SPECIAL TOOLS

37.02.02.01

1. To prevent over tightening a micrometer on an object while measuring, some micrometers, use a:

   a. spindle stop.
   b. lock nut.
   c. ratchet stop.
   d. thimble stop.

2. To accurately measure the diameter of a cylinder bore, it would be necessary to use a(n):

   a. inside micrometer.
   b. inside caliper.
   c. feeler gauge with piston.
   d. outside micrometer.

3. Dial indicator face markings are most commonly marked in:

   a. .0001 of an inch.
   b. .01 of an inch.
   c. .001 of an inch.
   d. none of the above

4. A depth gauge would be the correct precision measuring tool to insure:

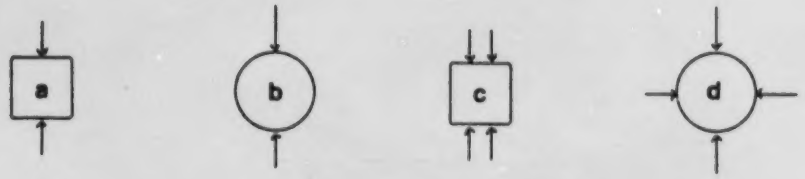
   a. correct installation height of valve guides in a head.
   b. accurate out-of-roundness measurement of cylinder bores.
   c. accurate measurement of piston pin diameter.
   d. accurate fluid level of wheel cylinders.

5. When using a ten-thousandths micrometer to measure a metal piece, which of the following will have an effect?

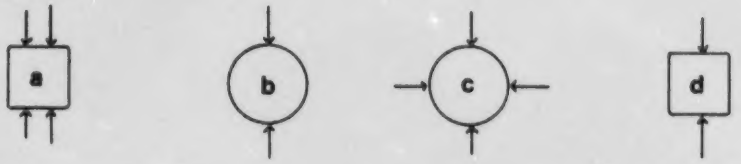
   a. temperature
   b. metal design
   c. weight
   d. metal type

37.02.02.02

6. Which of the following illustrations shows the correct way to make an out-of-round measurement of a journal?



7. Which of the following illustrations shows the correct way to take a taper measurement of a journal?



8. Precision checking of an outside micrometer is done with items called:

   a. calibrators.
   b. spaces.
   c. inside bars.
   d. standards.

9. To obtain a reading from a small hole gauge, what must be used?

   a. inside caliper
   b. outside micrometer
   c. inside micrometer
   d. dial indicator

10. Feeler gauges can be obtained in:

   a. hundredths of an inch.
   b. thousandths of an inch.
   c. ten-thousandths of an inch.
   d. none of the above.

37.02.02.03

11. Diameter measurement of thread crest to crest is called:

   a. pitch.
   b. minor diameter.
   c. major diameter.
   d. screw length.

37.02.02.03 cont.

12. The turning or twisting force exerted upon an object is referred to as:

    a. tension.
    b. torque.
    c. elastic limit.
    d. distortion.

13. To convert foot pounds to inch pounds:

    a. divide the inch pounds by 1/2.
    b. multiply the foot pounds by 12.
    c. divide the foot pounds by 12.
    d. none of the above.

14. Torque specifications should be obtained from:

    a. the manufacturer.
    b. another experienced mechanic.
    c. a fastener quality chart.
    d. none of the above.

15. Cotter key ends (when installed) should be bent:

    a. so the ends will not interfere with some part.
    b. so that they are aligned with fastener unit.
    c. so that they are perpendicular to the keyed nut.
    d. none of the above.

UNIT PRETEST ANSWER KEY: SPECIAL TOOLS

LAP 01

1. c
2. a
3. c
4. a
5. a

LAP 02

6. d
7. a
8. d
9. b
10. b

LAP 03

11. c
12. b
13. b
14. a
15. a

PROCEDURE: (cont.)

7. Return the textbook.
8. Obtain a copy of the LAP test.
9. Complete and score the LAP test. Return the answer sheet.
10. If the score is less than 80%, review the material.
11. Upon successful completion, go to the next LAP.

Student: _____ File Code: 37.02.02.01.81-2

Date: _____ Date Published: 3/4/76

LAP TEST: PRECISION MEASURING TOOL FUNDAMENTALS

1. To clean a precision measuring tool, the mechanic:

   a. none of the following.
   b. can carefully dip the tool in solvent and blow dry.
   c. can wipe the tool with a rag soaked with solvent.
   d. can wipe the tool with a soft dry rag.

2. Pistons, crankshafts and pins can be accurately measured by a(n):

   a. depth gauge.
   b. inexpensive venier caliper.
   c. outside micrometer.
   d. hole gauge.

3. The micrometer scale usually measures a total distance of ____ at a time.

   a. a half-inch.
   b. .001 of an inch.
   c. no answer.
   d. an inch.

4. The measuring work piece is placed between what parts of the outside micrometer?

   a. anvil and sleeve
   b. frame and anvil
   c. frame and spindle
   d. anvil and spindle

5. One thousandths of an inch is written as:

   a. 100 ths.
   b. .01.
   c. .001.
   d. 0001.

6. To accurately measure the diameter of a cylinder bore, it would be necessary to use a(n):

   a. inside micrometer.
   b. inside caliper.
   c. feeler gauge with piston.
   d. outside micrometer only.

7. The dial indicator is a precision tool designed to measure movements in what part of an inch? (most common)

   a. .0001
   b. .01
   c. .001
   d. .1

8. A depth gague would be the correct precision measuring tool to insure:

   a. correct installation height of valve guides in a head.
   b. accurate out-of-roundness measurement of cylinder bores.
   c. accurate measurement of piston pin diameter.
   d. accurate fluid level of wheel cylinders.

9. Telescoping gauges can be used to accurately measure:

   a. inside bore diameters.
   b. length of small bores.
   c. piston travel in a cylinder.
   d. none of the above answers.

10. When using a ten-thousandths micrometer to measure a metal piece, which of the following will have an effect?

    a. temperature
    b. metal design
    c. weight
    d. none of the above.

LAP TEST ANSWER KEY: PRECISION MEASURING TOOL FUNDAMENTALS

1. d
2. c
3. d
4. d
5. c
6. a
7. c
8. a
9. a
10. a

File Code: 37.02.02.02.B1-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Precision Measuring Tools Practice

OBJECTIVE:

Recognize proper care and use of precision measuring tools.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Service and Repair, Stockel.

Equipment:
- cylinder taper gauge
- dial indicator
- micrometer
  - inside
  - outside
  - depth
- rules
- scales
- telescoping gauge

PROCEDURE:

1. Review Chapter 2 in Auto Service and Repair.
2. Study carefully the sections on reading the micrometers in Auto Service and Repair.
3. Ask the instructor to evaluate your performance of care and use of precision measuring tools (ask the instructor for an object to measure with a micrometer).
4. Record the objects measured and the readings of the micrometer.
5. Show the recorded results to the instructor for evaluation.
6. Obtain a copy of the LAP test.

Principal Author(s):

C. Schramm/W. Osland

PROCEDURE: (cont.)

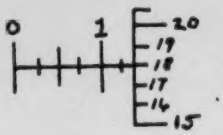
7. Complete and score the LAP test. Return the answer sheet.
8. If the score is less than 80%, review the material.
9. Upon successful completion, go to the next LAP.

Student: _____ File Code: 37.02.02.02.B1-2

Date: _____ Date Published: 6-15-77

LAP TEST: PRECISION MEASURING TOOLS PRACTICE

1. The illustration below shows which of the following micrometer readings?



a. .118
b. .128
c. .173
d. .143

2. To prevent over tightening a micrometer on an object while measuring, some micrometers use a:

a. spindle stop.
b. lock nut.
c. ratchet stop.
d. thimble stop.

5. Dial indicator face markings are most commonly marked in:

a. thousandths of an inch.
b. thousandths in fractions.
c. ten-thousandths of an inch.
d. none of the above.

7. An accurate measurement of minimal movement would be done effectively with a(n):

   a. telescoping gauge.
   b. inside micrometer.
   c. feel gauge.
   d. dial indicator.

8. Before using a precision measuring instrument, it should be checked for:

   a. damage.
   b. accuracy.
   c. cleanliness.
   d. none of the above.

9. Precision checking of an outside micrometer is done with items called:

   a. calibrators.
   b. spacers.
   c. inside bars.
   d. standards.

10. To obtain a reading from a small hole gauge, what must be used?

   a. inside caliper.
   b. outside micrometer.
   c. inside micrometer.
   d. dial indicator.

LAP TEST ANSWER KEY: PRECISION MEASURING TOOLS PRACTICE

1. D
2. C

5. A

7. D
8. B
9. D
10. B

File Code: 37.02.02.03.B1-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Fasteners and Torque Wrench

OBJECTIVE:

Identify the correct fasteners and torque for specific uses.

EVALUATION PROCEDURE:

Correclty answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Service and Repair, Stockel.

PROCEDURE:

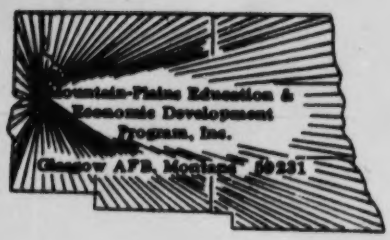
1. Read Chapter 3, pages 3-1 to 3-20, in Auto Service and Repair.
2. On a separte sheet of paper, write the answers to the questions on page 3-19 and 3-20 in Auto Service and Repair.
3. Return the textbook. Give the answer sheet to the instructor.
4. Obtain a copy of the LAP test.
5. Complete and score the LAP test. Return the answer sheet.
6. If the score is less than 80%, review the material.
7. Upon successful completion, go to the next LAP.

Principal Author(s):

C. Schramm/W. Osland

Student: _____ File Code: 37.02.02.03. B1-2

Date: _____ Date Published: 3/4/76



LAP TEST: FASTENERS AND TORQUE WRENCH

1. A metal rod that is threaded on both ends is referred to a:

   a. bolt.
   b. stud.
   c. machine bolt.
   d. none of the above.

2. The turning or twisting force exerted upon an object is referred to as:

   a. tension.
   b. torque.
   c. elastic limit.
   d. distortion.

3. The pulling force on a fastener is referred to as:

   a. torque.
   b. elastic limit.
   c. tension.
   d. distortion.

4. In most cases a fastener should be tightened until it has built up a tension within itself that is around 50 to 60 percent of its:

   a. tension.
   b. torque.
   c. elastic limit.
   d. none of the above.

5. Radial lines on bolt heads indidate:

   a. elastic limit.
   b. distortion.
   c. tensile strength.
   d. residual tension.

6. The torque wrench uses what law in its construction?

   a. Hooke's Law
   b. Law of Distortion
   c. Law of Relativity
   d. Ohm's Law

7. To convert foot pounds to inch pounds:

   a. divide the inch pounds by 1/2.
   b. multiply the foot pounds by 12.
   c. divide the foot pounds by 12.
   d. subtract 12 from the foot pounds.

8. When torquing down a large unit, torquing should be:

   a. started at one end and tightened to the other end.
   b. started at opposite ends and work towards the center.
   c. started in the center and tightened outward in a circular fashion.
   d. none of the above.

9. Torque specifications should be obtained from:

   a. the manufacturer.
   b. another experienced mechanic.
   c. a fastener quality chart.
   d. none of the above.

10. Cotter key ends (when installed) should be bent:

   a. so the ends will not interfere with some part.
   b. so that they are aligned with fastener unit.
   c. so that they are perpendicular to the keyed nut.
   d. none of the above.

LAP TEST ANSWER KEY: FASTENERS AND TORQUE WRENCH

1. b
2. b
3. c
4. c
5. c
6. a
7. b
8. c
9. a
10. a

Student: _____ File Code: 37.02.02.00.C1-2

Date: _____ Date Published: 3/16/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

UNIT POST TEST: SPECIAL TOOLS A

37.02.02.01

1. The venier micrometer reads up to:

   a. .01 of an inch.
   b. .001 of an inch.
   c. .0001 of an inch.
   d. none of the above.

2. To prevent over tightening a micrometer on an object while measuring, some micrometers, use a:

   a. spindle stop.
   b. lock nut.
   c. ratchet stop.
   d. thimble stop.

3. Dial indicator face markings are most commonly marked in:

   a. .0001 of an inch.
   b. .01 of an inch.
   c. .001 of an inch.
   d. .1 of an inch.

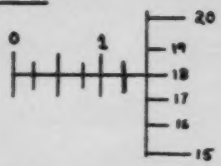
4. Used spark plugs must have their gap checked with a:

   a. feeler gauge.
   b. thickness gauge.
   c. steel rule.
   d. wire gauge.

5. Telescoping gauges can be used to accurately measure:

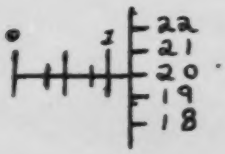
   a. inside bore diameter.
   b. length of small bores.
   c. piston travel in a cylinder.
   d. none of the above answers.

37.02.02.02

6. 

The above illustration of a micrometer reading shows which of the following measurements?

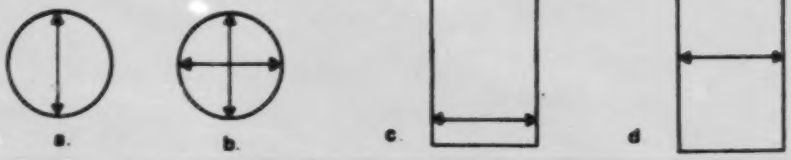
a. .118
b. .128
c. .113
d. .143

7. 

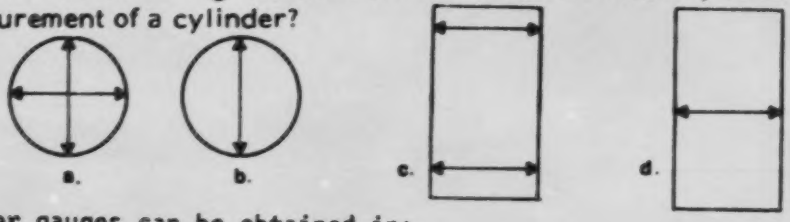
The above illustration shows which of the following micrometer readings?

a. .119
b. 1.20
c. .120
d. .160

8. Which of the following illustrations shows the correct way to take an inside taper measurement for a cylinder?



9. Which of the following illustrations shows the correct way to take an out-of-round measurement of a cylinder?



10. Feeler gauges can be obtained in:

a. hundredths of an inch.
b. thousandths of an inch.
c. ten-thousandths of an inch.
d. none of the above.

37.02.02.03

11. Diameter measurement of thread crest to crest is called:

    a. pitch.
    b. minor diameter.
    c. major diameter.
    d. screw length.

12. The operating clearance between the nut internal threads and the bolt external threads is called the:

    a. thread size.
    b. thread pitch.
    c. thread class.
    d. none of the above.

13. The torque wrench uses what law in its construction?

    a. Hooke's Law
    b. Law of Distortion
    c. Ohm's Law
    d. Law of Relativity

14. To convert foot pounds to inch pounds:

    a. divide the inch pounds by 1/2.
    b. multiply the foot pounds by 12.
    c. divide the foot pounds by 12.
    d. subtract 12 from the foot pounds.

15. Torquing down a special large unit should be:

    a. started at one end and tightened to the other end.
    b. started at opposite ends and work towards the center.
    c. started in the center and tightened outward in a circular fashion.
    d. none of the above.

UNIT POST TEST ANSWER KEY: SPECIAL TOOLS (A)

LAP 01

1. c
2. c
3. c
4. d
5. a

LAP 02

6. d
7. c
8. c
9. a
10. b

LAP 03

11. c
12. c
13. a
14. b
15. c

Student: _____ File Code: 37.02.02.00.C1-2 (B)

Date: _____ Date Published: 10-3-77

UNIT POST TEST: SPECIAL TOOLS (B)

37.02.02.01

1. Telescoping gauges can be used to accurately measure:

   a. inside bord diameter.
   b. length of small bores.
   c. piston travel in a cylinder.
   d. none of the above answers.

2. Used spark plugs must have their gap checked with a:

   a. feeler gauge.
   b. thickness gauge.
   c. steel rule.
   d. wire gauge.

3. Dial indicator face markings are most commonly marked in:

   a. .0001 of an inch.
   b. .01 of an inch.
   c. .001 of an inch.
   d. .1 of an inch.

4. To prevent over tightening a micrometer on an object while measuring, some micrometers use a:

   a. spindle stop.
   b. lock nut.
   c. ratchet stop.
   d. thimble stop.

5. The venier micrometer reads up to:

   a. .01 of an inch.
   b. .001 of an inch.
   c. .0001 of an inch.
   d. none of the above.

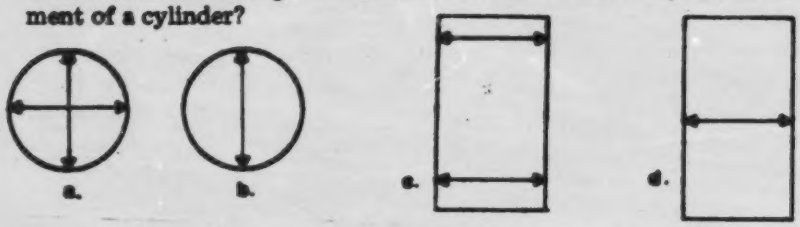
37.02.02.02

6. Feeler gauges can be obtained in:

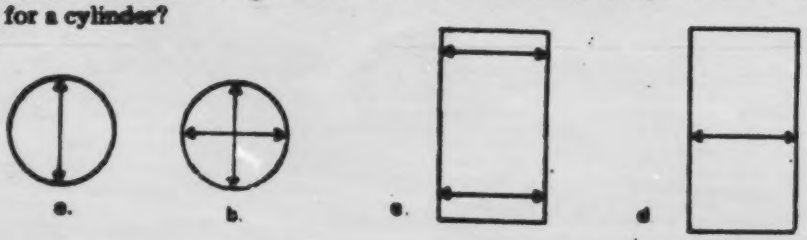
   a. hundredths of an inch.
   b. thousanths of an inch.
   c. ten-thousandths of an inch.
   d. none of the above.

37.02.02.02 (continued)

7. Which of the following illustrations shows the correct way to take an out-of-round measurement of a cylinder?

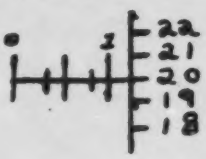


8. Which of the following illustrations shows the correct way to take an inside taper measurement for a cylinder?

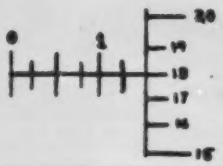


9. The below illustration shows which of the following micrometer readings?

a. .119
b. 1.20
c. .120
d. .160



10. The below illustration of a micrometer reading shows which of the following measurements?



a. .118
b. .128
c. .113
d. .143

37.02.02.03

11. Torquing down a special large unit should be:

a. started at one end and tightened to the other end.
b. started at opposite ends and worked towards the center.
c. started in the center and tightened outward in a circular fashion.
d. none of the above.

12. To convert foot pounds to inch pounds:

a. divide the inch pounds by 1/2.
b. multuply the foot pounds by 12.
c. divide the foot pounds by 12.
d. subtract 12 from the foot pounds.

37.02.02.03 (continued)

13. The torque wrench uses what law in its construction?

    a. Hooke's Law
    b. Law of Distortion
    c. Ohm's Law
    d. Law of Relativity

14. The operating clearnance between the nut internal threads and the bolt external threads is called the:

    a. thread size.
    b. thread pitch.
    c. thread class.
    d. none of the above.

15. Diameter measurement of thread crest to crest is called:

    a. pitch.
    b. minor diameter.
    c. major diameter.
    d. screw length.

UNIT POST TEST ANSWER KEY: SPECIAL TOOLS (B)

LAP 01

1. A
2. D
3. C
4. C
5. C

LAP 02

6. B
7. A
8. B
9. C
10. D

LAP 03

11. C
12. B
13. A
14. C
15. C

Author: _____ File Code: 37.02.02.00.C1-2(C)

Date: _____ Date Published: 5-24-77

UNIT POST TEST: SPECIAL TOOLS (C)

37.02.02.01

1. To prevent over tightening a micrometer on an object while measuring, some micrometers, use a:

   a. spindle stop.
   b. lock nut.
   c. ratchet stop.
   d. thimble stop.

2. Telescoping gauges can be used to accurately measure:

   a. inside bore diameter.
   b. length of small bores.
   c. piston travel in a cylinder.
   d. none of the above answers.

3. The venior micrometer reads up to:

   a. .01 of an inch.
   b. .001 of an inch.
   c. .0001 of an inch.
   d. none of the above.

4. Dial indicator face markings are most commonly marked in:

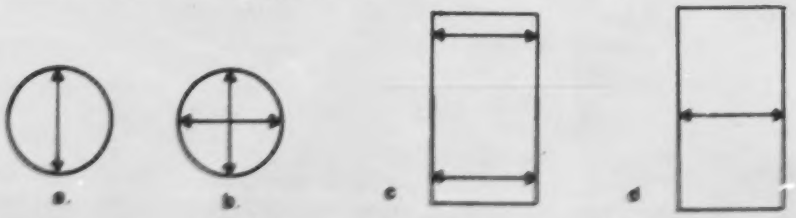
   a. .0001 of an inch.
   b. .01 of an inch.
   c. .001 of an inch.
   d. .1 of an inch.

5. Used spark plugs must have their gap checked with a:

   a. feeler gauge.
   b. thickness gauge.
   c. steel rule.
   d. wire gauge.

37.02.02.02

6. Which of the following illustrations shows the correct way to take an inside taper measurement for a cylinder?



37.02.02.02 (continued)

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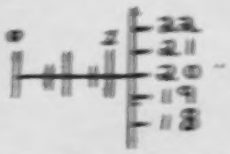
a. .119
b. 1.20
c. .120
d. .160



8. Feeler gauges can be obtained in:

a. hundredths of an inch.
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c. ten-thousandths of an inch.
d. none of the above.

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b. .128
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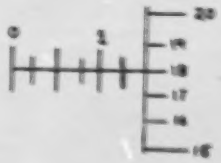

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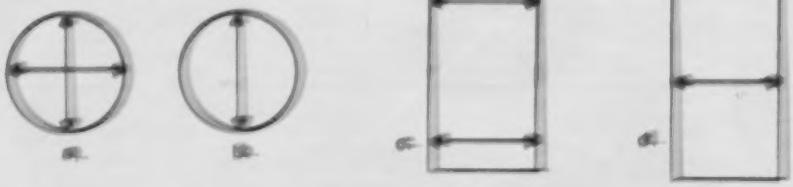


37.02.02.03

11. Torquing down a special large unit should be:

a. started at one end and tightened to the other end.
b. started at opposite ends and worked towards the center.
c. started in the center and tightened outward in a circular fashion.
d. none of the above.

12. Diameter measurement of thread crest to crest is called:

a. pitch.
b. minor diameter.
c. major diameter.
d. screw length.

13. To convert foot pounds to inch pounds:

a. divide the inch pounds by 1/2
b. multiply the foot pounds by 12.
c. divide the foot pounds by 12.
d. subtract 12 from the foot pounds.

37.02.02.03 (continued)

14. The torque wrench uses what law in its construction?

a. Hooke's Law
b. Law of Distortion
c. Ohm's Law
d. Law of Relativity

15. The operating clearance between the nut internal threads and the bolt external threads is called the:

a. thread size.
b. thread pitch.
c. thread class.
d. none of the above.

UNIT POST TEST ANSWER KEY: SPECIAL TOOLS (C)

LAP 01

1. C
2. A
3. C
4. C
5. D

LAP 02

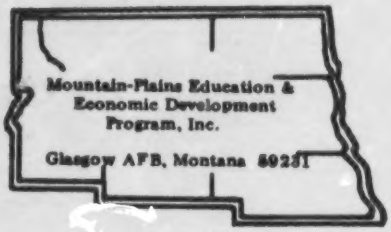
6. C
7. C
8. B
9. D
10. A

LAP 03

11. C
12. C
13. B
14. A
15. C

File Code: 37.02.03.00.B1-1

Date Published: 3/4/76



Learning Experience Guide

UNIT: SHOP EQUIPMENT

RATIONALE:

The identification and use of shop equipment in this unit enables one to properly operate the shop equipment used by the automotive mechanic.

PREREQUISITES:

None

OBJECTIVES:

Identify shop equipment. Demonstrate the proper use of shop equipment.

RESOURCES:

Printed Material

Auto Service and Repair. Stockel, Goodheart-Willcox Company, Inc.

Equipment

Presses, arbor
Presses, piston pin
Pullers, axle
Pullers, flywheel
Pullers, pully
Pullers, seal
Pullers, steering wheel
Pullers, vibrator dampener
Jacks
Lifts

GENERAL INSTRUCTION:

This unit consist of four Learning Activity Packages (LAPs). Each LAP will provide specific information for completion of a learning activity.

The general procedure for this unit is as follows:

(1) Read the first assigned Learning Activity Package (LAP).
(2) Begin and complete the first assigned LAP.
(3) Take and score the LAP test.
(4) Turn in the LAP test answer sheet.

Principal Author(s):

C. Schramm/W. Osland

GENERAL INSTRUCTIONS: (cont.)

(5) Determine the reason for any missed items on the LAP test.
(6) Proceed to and complete the next assigned LAP in the unit.
(7) Complete all required LAPs for the unit by following steps 3 through 6.
(8) In this unit, there are some LAPs that have tests combined with other LAP tests. These combined tests are taken after completing the last LAP covered by the test.
(9) Take the unit tests as described in the Unit LEG "Evaluation Procedures".
(10) Proceed to the next assigned course.

PERFORMANCE ACTIVITIES:

.01 Shop Equipment Fundamentals
.02 Jacks and Lifts Practice
.03 Presses and Pullers Practice
.04 Toolroom Observation

EVALUATION PROCEDURE:

Score at least 80% correct answers on the unit post test. There is no performance test for this unit.

FOLLOW-THROUGH:

Go to the first Learning Activity Package (LAP) listed on your Student Progress Record (SPR).

Student: _____ File Code: 37.02.03.00.B1-2

Date: _____ Date Published: 3/16/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

UNIT PRETEST: SHOP EQUIPMENT

37.02.03.01

1. A hydraulic hand jack can be quite dangerous:

   a. if there is evidence of fluid leaking from the seals.
   b. if it is not strong enough for the needed work.
   c. if it is not properly placed.
   d. if not placed on uneven ground.

2. The work table of the hydraulic press is supported by:

   a. a table wrench.
   b. a table wrench crank handle.
   c. a ram head lock.
   d. table lock pins.

3.

4. The press is far superior to striking tools in that:

   a. more force can be applied.
   b. the pressure is smooth and controlled.
   c. there is no loss of metal at the contact point.
   d. none of the above.

5.

37.02.03.02

6. A single or double post frame list requires that the lift pads be:

   a. adjusted to match the frame.
   b. adjusted to lift the center of the vehicle.
   c. adjusted to lift the body evenly.
   d. none of the above.

7.

8. The adjustable extension legs of the portable crane should be:

   a. lengthened as far as possible.
   b. lengthened out evenly.
   c. adjusted with the top arm lengthened further.
   d. must be kept within one notch of each other.

9. To safely and effectively lift the front end of an average car, a jack should be used with a minimum rating of:

   a. 2 ton.
   b. 1/2 ton.
   c. 5 ton.
   d. 1 ton.

37.02.03.03

10. To prevent over-applying hydraulic pressure when using the press, it is equipped with a:

    a. pressure register gauge.
    b. pressure relief valve.
    c. safety release valve.
    d. none of the above.

11. An effective tool (available from the toolroom) for removing rear axle seals would be the:

    a. slide hammer.
    b. mechanical puller.
    c. gear puller.
    d. wheel puller.

37.02.03.03 (continued)

12. On a press, the operator should stand free while the:

    a. pressure exceeds over 1000 psi.
    b. pressure is released.
    c. work piece is about to "pop" free.
    d. pressure is applied.

13. The abbreviation P.S.I. while working with a press stands for the words:

    a. pounds per square inch.
    b. pressure solidly increased.
    c. pressure steadily increased.
    d. perfected squared increasement.

37.02.03.04

14. Failure to clean tools before returning them to the toolroom will cause:

    a. premature failure of the hand wrenches.
    b. grease stained shelves where tools are stored.
    c. fellow mechanic's disenchantment with others.
    d. all of the above.

15.

UNIT PRETEST ANSWER KEY: SHOP EQUIPMENT

LAP 01

1. c
2. d
3. a
4. b
5. c

LAP 02

6. a
7. b
8. b
9. d

LAP 03

10. a
11. a
12. d
13. a

LAP 04

14. d
15. d

File Code: 37.02.03.01 B1 0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Shop Equipment Fundamentals

OBJECTIVES:

Identify basic shop equipment (jacks, cranes, presses, etc.) and their proper use and maintenance.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Service and Repair, Stockel.

PROCEDURE:

1. Read Chapter 7, pages 7-1 through 7-11, in Auto Service and Repair.
2. Study Figures 7-1 through 7-28 in Auto Service and Repair.
3. On a separate sheet of paper, answer questions 1-24 on page 7-10 and 7-11 in Auto Service and Repair.
4. Give the answer sheet to the instructor for evaluation.
5. Return the textbook to the proper shelf.
6. Obtain a copy of the LAP test.
7. Complete and score the LAP test. Return the answer sheet.
8. If the score is less than 80%, review the material.
9. Upon successful completion, go to the next LAP.

Principal Author(s):

J. Anderson/W. Osland

Standard: _____ File Code: 37.02.03.01.B1-2

Date: _____ Date Published: 6-15-77

LAP TEST: SHOP EQUIPMENT FUNDAMENTALS

1. A piece of shop equipment that can be used to move vehicles around in tight places is the:

   a. hydraulic hand jack.
   b. hydraulic floor jack.
   c. wheel dolly.
   d. extension jack.

2. Work beneath a vehicle (after raised with a jack) should be done only after:

   a. the installation of jack locking mechanisms.
   b. the installation of frame lifts.
   c. the installation of jackstands.
   d. locking the parking brake.

3. When operating a bumper jack, the bumper contacts should be placed:

   a. at each end of the bumper.
   b. at the frame to bumper brackets.
   c. on the thickest part of the bumper.
   d. near the center of the bumper.

4. A possible danger of the transmission jack usage is failure to:

   a. secure the transmission to the jack.
   b. center the jack beneath the transmission.
   c. align the jack accurately with the transmission.
   d. none of the above.

5. When using a bumper jack, the car;

   a. should be in neutral and rear wheels jacked up.
   b. should be in neutral and brakes off.
   c. should be in neutral and emergency brake off.
   d. none of the above.

6. The work table of the hydraulic press is supported by:

   a. a table wrench.
   b. a table wrench crank handle.
   c. a ram head lock.
   d. table lock pins.

7. An extension jack facilitates easier work beneath a:

   a. vehicle on floor jackstands.
   b. vehicle on a locking bumper jack.
   c. none of the above.
   d. vehicle positioned on a lift.

8. The average full size car weight is about:

   a. two tons.
   b. one and 1/2 tons.
   c. one and 3/4 tons.
   d. one ton.

9. The unit that facilitates easier bearing removal would be a(n):

   a. none of these.
   b. outside puller set.
   c. bearing driver.
   d. hydraulic press.

10. The press is far superior to striking tools in that:

   a. more force can be applied.
   b. the pressure is smooth and controlled.
   c. there is no loss of metal at the contact point.
   d. none of the above.

LAP TEST ANSWER KEY: SHOP EQUIPMENT FUNDAMENTALS

1. B
2. C
3. B
4. A
5. C
6. D
7. D
8. A
9. D
10. B

File Code: 37.02.03.02.81-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Jacks and Lifts Practice

OBJECTIVE:

Recognize the correct procedure for using jacks and lifts.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Service and Repair, Stockel.

Jacks
Lifts

PROCEDURE:

1. Review pages 7-1 to 7-6 in Auto Service and Repair.
2. Study carefully the safety tips in each section on pages 7-1 to 7-6 in Auto Service and Repair.
3. Go into the shop area and observe the various lifts and jacks that are available.
4. Activate the various lifts and jacks available in the shop and notice their operation and limitations.
5. By each equipment name, record all the safety or precaution checks that should be mandatory before operating a particular piece of equipment.
6. Record the weight capacity of each piece of equipment tested.
7. If the score is less than 80%, review the material.
8. Upon successful completion, go to the next LAP. The LAP test will be given after completing LAP 37.02.03.04.

Principal Author(s):

C. Schramm, J. Anderson and W. Osland

File Code: 37.02.03.03. 31-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Presses and Pullers Practice

OBJECTIVE:

Recognize the correct procedure for using presses and pullers.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Service and Repair, Stockel.

Equipment:

- Presses, arbor
- Presses, piston pin
- Pullers, axle
- Pullers, flywheel
- Pullers, pully
- Pullers, seal
- Pullers, steering wheel
- Pullers, vibrator dampener

PROCEDURE:

1. Review pages 7-7 to 7-9 in Auto Service and Repair.
2. Study carefully the safety precautions on page 7-7 in Auto Service and Repair.
3. Go into the shop area and observe the various presses and pullers that are available.
4. Record the proper names and the condition of the pullers and presses available in the shop.
5. Notice what each puller is used for and its proper name and estimated capacity.
6. Record each puller's name and its use on paper.

Principal Author(s):

C. Schramm, J. Anderson and W. Osland

PROCEDURE:

7. Examine the presses and record their proper name, capacities and warnings.

8. If the score is less than 80%, review the material.

9. Upon successful completion, go on to the next LAP. The LAP test will be given after completing LAP 37.02.03.04.

File Code: 37.02.03.04.B1-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Toolroom Observation

OBJECTIVES:

Identify proper placement of tools. Proper check out procedures of tools from the shop toolroom.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

None

PROCEDURE:

1. Go to the toolroom.
2. Notice the location of the tools and equipment that are stored there.
3. Notice the procedure used to check out tools.
4. Complete the attached checklist using the "Toolroom Man Evaluation Sheet".
5. List your suggestions that would help eliminate the "unsatisfactory rating" problems that you found during your evaluation of the toolroom.
6. List five major problems that are created by failure to operate the toolroom satisfactorily.
7. Ask the instructor to evaluate your checklist.
8. Obtain a copy of the LAP test.
9. Complete and score the LAP test. Return the answer sheet.
10. If the score is less then 80%, review the material.
11. Upon successful completion, go to the next LAP.

Principal Author(s):

C. Schramm, J. Anderson and W. Osland

TOOL ROOM MAN EVALUATION SHEET

Name _____ Date _____ Time _____ Instructor _____

Check Items	Satisfactory	Unsatisfactory	Corrected
Floor clean	☐	☐	☐
Trash can emptied	☐	☐	☐
Rags neat	☐	☐	☐
Tools orderly	☐	☐	☐
Tools clean	☐	☐	☐
Orderly check-list	☐	☐	☐
Bench tops clean	☐	☐	☐
All shelves clean & orderly	☐	☐	☐
Tool board clean & orderly	☐	☐	☐
Floor equipment orderly	☐	☐	☐
Drop cords orderly	☐	☐	☐
Air hoses orderly	☐	☐	☐

CHECK LIST: Name: _____ All checked in: ☐ Date: _____

$\frac{3}{8}$ drive sockets = $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{9}{16}$ $\frac{5}{8}$ $\frac{11}{16}$ $\frac{3}{4}$ $\frac{13}{16}$ $\frac{7}{8}$ $\frac{15}{16}$ 1 $1\frac{1}{4}$

ratchet ☐ size extension _____ speed wrench ☐

$\frac{1}{2}$ drive sockets = $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{9}{16}$ $\frac{5}{8}$ $\frac{11}{16}$ $\frac{3}{4}$ $\frac{13}{16}$ $\frac{7}{8}$ $\frac{15}{16}$ 1 $1\frac{1}{4}$

ratchet ☐ size extension _____ speed wrench ☐

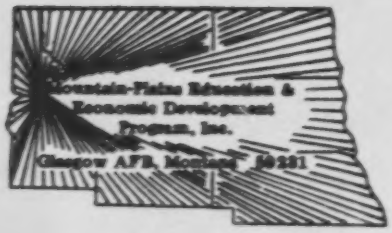
hand wrenches = $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{9}{16}$ $\frac{5}{8}$ $\frac{11}{16}$ $\frac{3}{4}$ $\frac{13}{16}$ $\frac{7}{8}$ $\frac{15}{16}$ 1 $1\frac{1}{4}$

__ Hammer	__ Creeper	__ Pliers	__ Tr. Light	__ Air Guage
__ Repair manual	__ Stands	__ Air nozzles	__ Hack saw	__ Impact Wr.
__ Fender cover	__ Drain pans	__ Electric drill	__ Pry bars	__ Allen wrenches
__ Screw driver	__ Nut drivers	__ Wire brush	__ Chisles	__ Tongue wrench

Additional Tools:

Student: _____ File Code: 37.02.03.02-.04 B1-2

Date: _____ Date Published: 11-7-77



LAP TEST: JACKS/LIFT, PRESSES/PULLERS PRACTICE, AND TOOLROOM OBSERVATION

37.02.03.02

1. A single or double post frame lift requires that the lift pads be:

   a. adjusted to match the frame.
   b. adjusted to lift the center of the vehicle.
   c. adjusted to lift the body evenly.
   d. none of the above.

2. The pressure release mechanism on a floor jack is located on the:

   a. jack body
   b. handle end
   c. handle grips (side)
   d. foot pump

3. The most noticeable neglect of the transmission jack is the:

   a. failure of cleaning the jack of spilt fluid.
   b. damage incurred by banging the jack into place.
   c. abuse of lifting too heavy objects.
   d. none of the above.

4. The adjustable extension arm of the portable crane should be:

   a. lengthened as far as possible.
   b. kept as short as possible.
   c. adjusted with the top arm lengthened further.
   d. lengthened out evenly.

5. When raising the front of a vehicle with a bumper jack, the vehicle should:

   a. have the parking brake firmly applied.
   b. be in neutral.
   c. have the rear wheels blocked.
   d. none of the above.

37.02.03.03

6. The hydraulic press in the shop has a capacity rating of:

   a. 17½ tons.
   b. 10 tons.
   c. 5½ tons.
   d. 20 tons.

37.02.03.03 (continued)

7. To prevent over-applying hydraulic pressure when using the press, it is equipped with a:

   a. pressure register gauge.
   b. pressure relief valve.
   c. safety release valve.
   d. none of the above.

8. An effective tool for removing rear axle seals would be the:

   a. gear puller
   b. wheel puller
   c. slide hammer
   d. mechanical puller

9. The abbreviation P.S.I. while working with a press stands for the words:

   a. pounds per square inch.
   b. pressure solidly increased.
   c. pressure steadily increased.
   d. perfected squared increasement.

10. The greatest danger of pullers under stress operation is the possibility:

   a. breaking the puller.
   b. none of these.
   c. binding which causes the puller to be difficult to turn.
   d. slipping out of place.

37.02.03.04

11. Failure to keep the toolroom in proper order would cause a major problem which is:

   a. loss of mechanic's time.
   b. loss of parts, tools and equipment.
   c. possible damage to valuable equipment.
   d. all of the above.

12. An effective procedure for knowing what equipment is out of the toolroom and in use is by:

   a. mandatory use of a checklist.
   b. voluntary requirement to return all tools.
   c. an effective tool marking to indicate where the equipment belongs.
   d. asking for instructor's permission.

13. Proper placement of tools in storage can be shown by use of:

   a. silhouettes.
   b. peg board and hooks.
   c. placing tool names above tool placements.
   d. all of the above.

37.02.03.04 (continued)

14. Of all uncleaned hand tools, the one upon which failure to clean has the greatest effect is:

    a. a socket
    b. a speed handle
    c. a rachet
    d. a box-end wrench

15. Failure to clean tools before returning them to the toolroom will cause:

    a. premature failure of the hand wrenches.
    b. grease-stained shelves where tools are stored.
    c. fellow mechanic's disenchantment with others.
    d. all of the above.

37.02.03.02.B1-2
37.02.03.03.B1-2
37.02.03.04.B1-2

LAP TEST ANSWER KEY: JACKS/LIFT, PRESSES/PULLERS PRACTICE, AND TOOLROOM OBSERVATION

1. A
2. B
3. A
4. B
5. B
6. A
7. A
8. C
9. A
10. D
11. D
12. A
13. D
14. C
15. D

Student: _____ File Code: 37.02.03.00, C1-2

Date: _____ Date Published: 3/16/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

UNIT POST TEST: SHOP EQUIPMENT (A)

37.02.03.01

1. A hydraulic hand jack can be quite dangerous:

   a. if there is any evidence of fluid leaking from the seals.
   b. if it is not strong enough for the needed work.
   c. if it is not properly placed.
   d. if not placed on uneven ground.

2. The portion of a jackstand or jack that contacts the lifting point is called a:

   a. lift-contact.
   b. cup.
   c. lift-center.
   d. saddle.

3. A unit that presents a relatively large obstruction area on a raised vehicle is the:

   a. double-post suspension lift.
   b. double-post frame lift.
   c. drive-on lift.
   d. single-post frame lift.

4. The press is far superior to striking tools in that:

   a. more force can be applied.
   b. the pressure is smooth and controlled.
   c. there is no loss of metal at the contact point.
   d. none of the above.

5.

37.02.03.02

6. The pressure release mechanism on a floor jack is located on the:

   a. handle end.
   b. jack body.
   c. handle grips (side).
   d. foot pump.

7. The most noticeable neglect of the transmission jack is the :

   a. failure of cleaning the jack of spilt fluid.
   b. damage incurred by banging the jack into place.
   c. abuse of lifting too heavy objects.
   d. none of the above.

8. The adjustable extension legs of the portable crane should be:

   a. lengthened as far as possible.
   b. lengthened out evenly.
   c. adjusted with the top arm lengthened further.
   d. must be kept within one notch of each other.

9. To safely and effectively lift the front end of an average car, a jack should be used with a minimum rating of:

   a. 2 ton.
   b. 1/2 ton.
   c. 5 ton.
   d. 1 ton.

37.02.03.03

10. The larger puller set available from the toolroom which has several available arm sets is referred to as:

    a. wheel puller.
    b. a mechanical puller.
    c. a 3-finger slide hammer.
    d. a hub puller.

11. An effective tool (available from the toolroom) for removing rear axle seals would be the:

    a. slide hammer.
    b. mechanical puller.
    c. gear puller.
    d. wheel puller.

37.02.03.03 (continued)

12. The mechanic's knowledge of the available presses and pullers within his shop will:

    a. be able to make his work easier and more efficient.
    b. satisfy the customer with his available equipment.
    c. have a greater selection of equipment to work with.
    d. impress other mechanics.

13. The abbreviation P.S.I. while working with a press stands for the words:

    a. pounds per square inch.
    b. pressure solidly increased.
    c. pressure steadily increased.
    d. perfected squared increasement.

37.02.03.04

14. Of all uncleaned hand tools, the one which will have the most ill effect upon itself is:

    a. sockets.
    b. a speed handle.
    c. a ratchet.
    d. box-end wrenches.

15. Failure to clean tools before returning them to the toolroom will cause:

    a. premature failure of the hand wrenches.
    b. grease stained shelves where tools are stored.
    c. fellow mechanic's disenchantment with others.
    d. all of the above.

UNIT POST TEST ANSWER KEY: SHOP EQUIPMENT (A)

LAP 01

1. c
2. d
3. c
4. b

LAP 02

6. a
7. a
8. b
9. a

LAP 03

10. b
11. a
12. a
13. a

LAP 04

14. c
15. d

Student: _____ File Code: 37.02.03.00.C1-2(B)

Date: _____ Date Published: 5-25-77

UNIT POST TEST: SHOP EQUIPMENT (B)

37.02.03.01

1. The press is far superior to striking tools in that:

   a. more force can be applied.
   b. the pressure is smooth and controlled.
   c. there is no loss of metal at the contact point.
   d. none of the above.

2. A unit that presents a relatively large obstruction area on a raised vehicle is the:

   a. double-post suspension lift.
   b. double-post frame lift.
   c. drive-on lift.
   d. single-post frame lift.

3. The portion of a jackstand or jack that contacts the lifting point is called a:

   a. lift-contact.
   b. cup.
   c. lift-center.
   d. saddle.

4. A hydraulic hand jack can be quite dangerous:

   a. if there is any evidence of fluid leaking from the seals.
   b. if it is not strong enough for the needed work.
   c. if it is not properly placed.
   d. if not placed on uneven ground.

37.02.03.02

5. To safely and effectively lift the front end of an average car, a jack should be used with a minimum rating of:

   a. 2 ton.
   b. 1/2 ton.
   c. 5 tons.
   d. 1 ton.

6. The adjustable extension legs of the portable crane should be:

   a. lengthened as far as possible.
   b. lengthened out evenly.
   c. adjusted with the top arm lengthened further.
   d. must be kept within one notch of each other.

37.02.03.02 (continued)

7. The most noticeable neglect of the transmission jack is the:

   a. failure of cleaning the jack of spilt fluid.
   b. damage incurred by banging the jack into place.
   c. abuse of lifting too heavy objects.
   d. none of the above.

8. The pressure release mechanism on a floor jack is located on the:

   a. handle end.
   b. jack body.
   c. handle grips (side).
   d. foot pump.

37.02.03.03

9. The abbreviation P.S.I. while working with a press stands for the words:

   a. pounds per square inch.
   b. pressure solidly increased.
   c. pressure steadily increased.
   d. perfected squared increasement.

10. The mechanic's knowledge of the available presses and pullers within his shop will:

   a. be able to make his work easier and more efficient.
   b. satisfy the customer with his available equipment.
   c. have a greater selection of equipment to work with.
   d. impress other mechanics.

11. An effective tool (available from the toolroom) for removing rear axle seals would be the:

   a. slide hammer.
   b. mechanical puller.
   c. gear puller.
   d. wheel puller.

12. The larger puller set available from the toolroom which has several available arm sets is referred to as:

   a. wheel puller.
   b. a mechanical puller.
   c. a 3-finger slide hammer.
   d. a hub puller.

37.02.03.04

13. Failure to clean tools before returning them to the toolroom will cause:

   a. premature failure of the hand wrenches.
   b. grease stained shelves where tools are stored.
   c. fellow mechanic's disenchantment with others.
   d. all of the above.

37.02.03.04

14. Of all uncleaned hand tools, the one which will have the most ill effect upon itself is:

a. sockets.
b. a speed handle.
c. a ratchet.
d. box-end wrenches.

UNIT POST TEST ANSWER KEY: SHOP EQUIPMENT (B)

LAP 01

1. B
2. C
3. D
4. C

LAP 02

5. A
6. B
7. A
8. A

LAP 03

9. A
10. A
11. A
12. B

LAP 04

13. D
14. C

Author: _____ File Code: 37.02.03.00.C1-2 (C)

Date: _____ Date Published: 6/3/77

UNIT POST TEST: SHOP EQUIPMENT (C)

37.02.03.01

1. A unit that presents a relatively large obstruction area on a raised vehicle is the:

   a. double-post suspension lift
   b. double-post frame lift
   c. drive-on lift
   d. single-post frame lift

2. A hydraulic hand jack can be quite dangerous:

   a. if there is any evidence of fluid leaking from the seals
   b. if it is not strong enough for the needed work
   c. if it is not properly placed
   d. if not placed on uneven ground

3. The press is far superior to striking tools in that:

   a. more force can be applied
   b. the pressure is smooth and controlled
   c. there is no loss of metal at the contact point
   d. none of the above

4. The portion of a jackstand or jack that contacts the lifting point is called a:

   a. lift-contact
   b. cup
   c. lift-center
   d. saddle

37.02.03.02

5. The adjustable extension legs of the portable crane should be:

   a. lengthened as far as possible
   b. lengthened out evenly
   c. adjusted with the top arm lengthened further
   d. must be kept within one notch of each other

6. The pressure release mechanism on a floor jack is located on the:

   a. handle end
   b. jack body
   c. handle grips (side)
   d. foot pump

37.02.03.02 cont.

7. The most noticeable neglect of the transmission jack is the:

   a. failure of cleaning the jack of spilt fluid
   b. damage incurred by banging the jack into place
   c. abuse of lifting too heavy objects
   d. none of the above

8. To safely and effectively lift the front end of an average car, a jack should be used with a minimum rating of:

   a. 2 ton
   b. ½ ton
   c. 5 ton
   d. 1 ton

37.02.03.03

9. The abbreviation P.S.I. while working with a press stands for the words:

   a. pounds per square inch
   b. pressure solidly increased
   c. pressure steadily increased
   d. perfected squared increasement

10. The mechanic's knowledge of the available presses and pullers within his shop will:

   a. be able to make his work easier and more efficient
   b. satisfy the customer with his available equipment
   c. have a greater selection of equipment to work with
   d. impress other mechanics

11. The larger puller set available from the toolroom which has several available arm sets is referred to as:

   a. wheel puller
   b. a mechanical puller
   c. a 3-finger slide hammer
   d. a hub puller

12. An effective tool (available from the toolroom) for removing rear axle seals would be the:

   a. slide hammer
   b. mechanical puller
   c. gear puller
   d. wheel puller

37.03.02.04

13. Of all uncleaned hand tools, the one which will have the most ill effect upon itself:

    a. sockets
    b. a speed handle
    c. a ratchet
    d. box-end wrenches

14. Failure to clean tools before returning them to the toolroom will cause:

    a. premature failure of the hand wrenches
    b. grease stained shelves where tools are stored
    c. fellow mechanic's disenchantment with others
    d. all of the above

UNIT POST TEST ANSWER KEY: SHOP EQUIPMENT (C)

LAP 01

1. C
2. C
3. B
4. D

LAP 02

5. B
6. A
7. A
8. A

LAP 03

9. A
10. A
11. B
12. A

LAP 04

13. C
14. D